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scale of salaries of the faculty of the college in all its departments as now constituted, and as increased later by the addition of the new professors and instructors including a librarian. I wish the trustees of the college to apportion the additional income received from the gift according to the relative importance and value, in their best judgment, of the services rendered in the different chairs, with due regard to length of service and to personal distinction.

A REUTER message from Kimberley states that the De Beers Company has made a donation of £25,000 towards the founding of a South African university.

FOR the purpose of furthering the educational relations between Germany and the United States, the announcement is made by Dr. Ernest Richard, of Columbia University, that a tour has been planned whereby American students can visit some of the leading German universities and come in personal contact with the German students and their ways of living. The tentative itinerary, in part, follows: Hamburg, Berlin, Leipzig, Goslar, Harz, Jena, Weimar, Dresden, Prague, Vienna, Nuremberg, Munich, Zurich, Strasbourg, Heidelberg, Mainz, Wiesbaden, Frankfurt, Halle, Marburg, Bonn, Cologne, Essen, Dinsburg, Dusseldorf, Bremen and London. The cost of the trip, which will last from sixty to sixty-three days, will be \$600.

MR. HORACE G. PERRY, in 1909-10 assistant in botany at Harvard University, has been appointed professor of botany in Acadia College, N. S.

DISCUSSION AND CORRESPONDENCE

"GENOTYPE"

IN SCIENCE for October 28, 1910, p. 588, it is announced that the American Society of Naturalists will soon discuss "Genotypes or pure lines of Johannsen." It is not stated who is responsible for this use of the word "genotype" or whether it has ever been employed before in this sense. In any case it should be pointed out that the word "genotype," first proposed in your own pages by Dr. C. Schuchert¹ has since been used by syste-

¹ April 23, 1897, p. 639.

matic biologists in ever-increasing number to denote the type-species of a genus. The confusion of thought caused in the past by diverse uses of the word "type" in biology must not be perpetuated; hence I confidently appeal to those who want a single word for the "pure lines of Johannsen" to leave "genotype" alone with its usual significance, and indeed to avoid any word with the syllable "type" in its composition. It may save possibly trouble to point out that the concept of the "pure line" differs not only from that of the "genotype" as hitherto used, but also from that of the "genus-norm."

F. A. BATHER

BRITISH MUSEUM (N. H.),
November 11, 1910

QUOTATIONS

ACADEMIC AND INDUSTRIAL EFFICIENCY

OUR colleges and universities have been so long under fire, and in so many ways, that it is truly surprising that the fundamental trouble with them has remained so long unrevealed. But now that—thanks to the report made by a mechanical engineer to the Carnegie Foundation—the light of modern industrial methods has been thrown upon them, there will no longer be any excuse for their persistence in evil. It may take a little time, to be sure, to put the new standards and ideals into effective operation, but that is merely a detail. The new day has dawned, and the only question that remains is what institutions will be foremost in gaining the favor of far-sighted and broad-minded men of wealth by conforming their ways to the principles of industrial efficiency. Student-time-units per professor, number of pages of standardized lecture notes, coordination of janitor-work with teaching-time, and a score of other measurements of efficiency which will occur to every competent college president, will take the place of those vague and intangible ways of estimating the merits of our institutions of learning that have hitherto prevailed. To argue the merits of the change would be a waste of words. In this age of industrial and commercial advance,

² Bather, SCIENCE, May 28, 1897, p. 844.

a reform which means progress toward mechanical standardization of methods and values is sure to receive so universal a welcome that its success is assured from the start.

While, therefore, the merits of a proposal to standardize our universities, abolish life tenure of professorships, and regulate research, speak for themselves, it is somewhat interesting, perhaps, to speculate on the probable origin of the idea. And here we venture a conjecture which we think must commend itself to the judicious. It is not so much to the defects of our own universities, we imagine, that the scheme owes its inception, but rather to the notorious failure of the universities of Germany, in which these defects have been far more pronounced. There they have never even had such a thing as a college president; and the professors have not only had an absolute life tenure, but have been allowed a degree of liberty in teaching that is simply scandalous. This has been going on for generation after generation, and everybody knows the result. German students have been slipshod and inaccurate, and no foreigner has gone to a German book for enlightenment or to a German university for training. As for research, these Germans have simply run riot; a German professor will spend years of his own time and that of his students in some obscure research, without asking anybody's advice or consent. And the consequence has been not only that deplorable intellectual sterility to which we have already referred, but a backwardness in the arts and industries depending on the applications of science—the chemical industries, for example—which has made modern Germany a laughing stock to her European neighbors. If we wish to avoid a like fate, we must hasten to standardize our universities, set time-clocks on the professors, and guard with scrupulous care against the spending of either time or money on any research that has not secured the formal approval of the president of the university, the board of trustees, and the Consolidated Audit Company.—*New York Evening Post*.

THERE is no question of the amount of time wasted by professors, lecturers and instructors

who speak slowly. A table prepared from my own notes gives the average word production of six "eminent" men in the lecture hall:

Professor	Subjects	Words a Minute
Binks	Mathematics	93 ¹
Jones	English	142
Smith	Physics	236 ²
Brown	History	191
Black	Chemistry	201
Squib	Greek	84

It is evident that the amount of work done by Smith is much in excess of that done by any of the others whose word production is set forth here. The distressing showing made by Binks and Squib needs no comment. It is plain that they are not giving full value for their money, as is Smith. It is true that Binks is an old man and has achieved something of a reputation among astronomers and that his lectures are largely attended, and that Squib has written several books which I have not had time to read, but these are matters of minor importance. The case of Brown is of peculiar interest, because I have been informed that his usual word-production does not exceed 120 + a minute. I caught him as he was addressing his class on the subject of the abstraction of his spectacles from their accustomed place. In his excitement his word production increased, and thus his capacity for more rapid speech was proved beyond question. I recommend that a satisfactory standard of word production be adopted, and that all professors, lecturers and instructors attain this average or suffer appropriate reduction in their pay.

This brings us naturally to the consideration of the time card in relation to education. It is already in use as affecting the students, but their instructors do not submit themselves to it. They should be obliged to do so. A system of time checks and cards would bring these men to their senses and teach them to be punctual.

Finally, I desire to direct attention to the fact that not one of my suggestions for the improvement of the administration of insti-

¹ Cleared throat four times.

² Did not clear throat once.

tutions of learning is merely theoretical or even experimental. All have been tried out in practise with excellent results. I can go to any one of hundreds of retail clothing shops, steel foundries, fish markets, woollen mills, great excavation firms, and the like, and get at a moment's notice scores of alert, capable men, properly trained and disciplined, who would be willing to undertake, for suitable compensation, the entire rearrangement and standardization of any college or university, and would guarantee to bring about results that would amaze any professor of Greek or Sanskrit that ever lived.—*Extracts from a report by N. J. Snook, M.R., to the trustees of the Buncombe Fund as presented in the New York Sun.*

SCIENTIFIC BOOKS

Physical and Commercial Geography: A Study of Certain Controlling Conditions of Commerce. By H. E. GREGORY, A. G. KELLER and A. L. BISHOP, Professors in Yale University. 8vo. Pp. viii + 469; figs. 26, pls. 3. Boston, Ginn & Co. 1910. \$3.00.

When twenty years ago Mr. Geo. G. Chisholm published his most excellent "Manual of Commercial Geography," he virtually created a new subject of study in English-speaking schools and colleges. America was ready for such a line of study, and the demand for a text has called into existence a goodly number of books, but a reviewer scanning them one after another discovers in all of them a more or less slightly disguised Chisholm, in a condensed form. The attempt to present the principles of commerce, the commodities of commerce, and the commercial countries all in one small volume, has resulted in the assembling of endless statistics, often with little juice, and less geography.

This, the latest American contribution to the subject, is an earnest attempt to go to the roots of things, and to plant the commercial activity of the world upon a philosophical basis, recognizing all the factors at work, but giving special attention to the geographic influences, and especially to the human element involved.

The book is divided into three parts, spaced about equally: I., The Natural Environment; II., Relation of Man to Natural Conditions; III., The Geography of Trade. The spirit of treatment is commendable. The authors realize that "it is interpretation rather than arbitrary memorizing which is of educational importance."

In Part I. commerce and the human point of view have been kept well in the foreground, though the choice of material is not always defensible. For if the student comes to this work with no preparation in physiography, this presentation will not give him the grounding he should have. And if the student brings to it the training in physiography of a good high school, much of the material here is superfluous.

The following suggestions are offered on Part I.: For the space allowed in illustrating harbors any one outside of Connecticut might complain of the prominence given to the insignificant harbors of that state (pp. 32-3). On page 93 we learn that "For some reason, animals have learned to use diluted oxygen rather than the more abundant nitrogen. . . ." One might infer that it was a matter of poor taste or bad judgment on the part of the animals! By implication the great capacity of water for heat is due to transparency and evaporation (p. 102). The principle of specific heat, in this case so important, can not be read in or between these lines. On page 106 we read "The temperature of space outside the atmosphere is probably the 'absolute zero'"—Langley's researches give us an estimate of about 5° C. above absolute zero. On page 121 ff. the form "survival of the fitter" occurs, as a suggested improvement over the classic form "fittest." This suggestion is evidently based upon the misapprehension that only two stages, the positive and comparative, are involved. As a matter of fact in any case where the original and proper term "fittest" is used, there are innumerable individuals involved, and it may be also innumerable stages or phases of adaptation, and the final term only is described. Nor has any one who ever used the term "fittest" in this sense thought for